

What is claimed is:

1. A valve assembly, comprising:

a housing;

a pump mechanism disposed in said housing;

a first plate mounted adjacent to said pump mechanism, said first plate having at least one aperture and at least one flexing flap;

a second plate mounted adjacent to said first plate, said second plate having at least one aperture and at least one flexing flap;

wherein said first and second plates are aligned such that the at least one aperture in said first plate is located adjacent the at least one flexing flap in said second plate and the at least one aperture in said second plate is located adjacent the at least one flexing flap in said first plate;

a cover mounted to said housing to substantially enclose said pump mechanism and said first and second plates; and

at least one outlet port in said cover for discharging fluid that has passed through said plates.

2. The valve assembly as claimed in claim 1, further comprising at least one inlet port in said cover for introducing fluid to be passed through said plates.

3. The valve assembly as claimed in claim 1, further comprising an inlet port in said housing for introducing fluid to be passed through said plates.

4. The valve assembly as claimed in claim 1, wherein:

said at least one aperture in said first plate comprises a plurality of apertures located along the inner periphery of said first plate;

and the at least one aperture in said second plate comprises a plurality of apertures located along the outer periphery of said second plate.

5. The valve assembly as claimed in claim 1, wherein:

said at least aperture in said first plate comprises a plurality of apertures located along the outer periphery of said first plate;

and the at least one aperture in said second plate comprises a plurality of apertures located along the inner periphery of said second plate.
6. The valve assembly as claimed in claim 1, wherein said pump mechanism comprises a compressor.
7. The valve assembly as claimed in claim 6, wherein said compressor is an air compressor.
8. The valve assembly as claimed in claim 6, wherein:

said housing comprises a first portion and a second portion;

the first portion comprises a cylinder block having at least one piston channel;

the second portion comprises a swash plate housing; and

said pump mechanism comprises a swash plate disposed in said swash plate housing and at least one piston coupled to said swash plate and slidably disposed in the at least one piston channel.
9. The valve assembly as claimed in claim 8, further comprising a drive shaft disposed in said cylinder block and said swash plate housing, wherein said swash plate is mounted on said shaft.
10. The valve assembly as claimed in claim 9, further comprising an actuator mounted on said shaft for exerting a force on said swash plate.
11. A valve assembly, comprising:

a housing;

a pump mechanism disposed in said housing;

a first plate mounted adjacent to said pump mechanism, said first plate having at least one aperture and at least one flexing flap;

a second plate mounted adjacent to said first plate, said second plate having at least one aperture and at least one flexing flap;

a cover mounted to said housing to substantially enclose said pump mechanism and said first and second plates;

at least one inlet port in said cover for introducing fluid that is to be passed through said plates;

at least one outlet port in said cover for discharging fluid that has passed through said plates;

a first fluid pathway defined when the at least one flexing flap of said second plate is disposed against the at least one aperture of said first plate and the at least one flexing flap of said first plate is biased away from the at least one aperture of said second plate, in which fluid flows through said inlet port, through the at least one aperture in said second plate, past the at least one flexing flap in the first plate, and into said housing; and

a second fluid pathway defined when the at least one flexing flap of said first plate is disposed against the at least one aperture of said second plate and the at least one flexing flap of said second plate is biased away from the at least one aperture of said first plate, in which fluid flows from said housing, through the at least one aperture in said first plate, past the at least one flexing flap in the second plate, and out said outlet port.

12. A valve assembly, comprising:

a swash plate housing at least partially enclosing a swash plate chamber;

a cylinder block mounted to said swash plate housing, said cylinder block having at least one passageway and at least one piston channel;

a pump mechanism disposed in said swash plate housing and cylinder block;

a first plate mounted adjacent to said cylinder block, said first plate having at least one aperture and at least one flexing flap;

a second plate mounted adjacent to said first plate, said second plate having at least one aperture and at least one flexing flap;

a cover mounted to said housing to substantially enclose said pump mechanism and said first and second plates;

at least one inlet port in said swash plate housing for introducing fluid that is to be passed through said plates;

at least one outlet port in said cover for discharging fluid that has passed through said plates;

a first fluid pathway defined when the at least one flexing flap of said second plate is disposed against the at least one aperture of said first plate and the at least one flexing flap of said first plate is biased away from the at least one aperture of said second plate, in which fluid flows through said inlet port and into said swash plate chamber, through the passageway, into said cover, through the at least one aperture in said second plate, past the at least one flexing flap in the first plate, and into the piston channel; and

a second fluid pathway defined when the at least one flexing flap of said first plate is disposed against the at least one aperture of said second plate and the at least one flexing flap of said second plate is biased away from the at least one aperture of said first plate, in which fluid flows from the piston channel, through the at least one aperture in said first plate, past the at least one flexing flap in the second plate, and out said outlet port.